SHARP SERVICE MANUAL

S3809R212BPR/

MICROWAVE OVEN



MODEL R-212B

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

TABLE OF CONTENTS WARNING 1 OPERATION SEQUENCE 4 FUNCTION OF IMPORTANT COMPONENTS 5 SERVICING AND TROBLE SHOOTING GUIDE6 COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE 18

SERVICE MANUAL

SHARP

MICROWAVE OVEN

R-212B

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked " Δ " on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP CORPORATION
OSAKA, JAPAN

PRODUCT SPECIFICATIONS

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

SERVICING AND TROUBLESHOOTING CHART

TEST PROCEDURE

CONTROL PANEL ASSEMBLY

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

WIRING DIAGRAM

PARTS LIST

PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION			
Power Requirements	220 Volts 50 Hertz Single phase, 3 wire earthed			
Power Consumption	1.06 kW			
Power Output	700 watts nominal of RF microwave energy (IEC 705) Operating frequency 2450 MHz			
Case Dimensions	Width 450 mm Height 295 mm including foot Depth 355 mm			
Cooking Cavity Dimensions	Width 288 mm Height 195 mm Depth 319 mm			
Turntable diameter	272 mm			
Control Complement	Light up dial timer (30 minutes) Microwave Power for Variable Cooking Repetition Rate; HIGH			
Set Weight (Approx.)	13 kg			

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

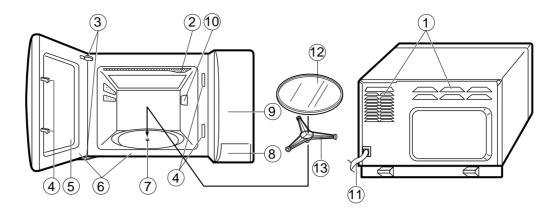
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH
BLUE : NEUTRAL
BROWN : LIVE

APPEARANCE VIEW

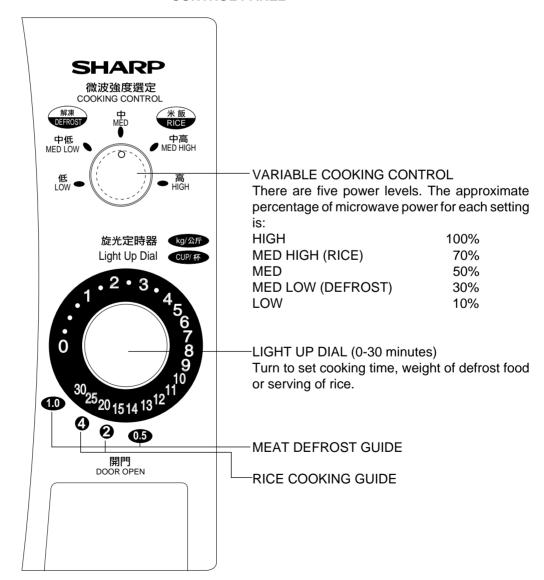
OVEN



- 1. Ventilation openings
- 2. Oven lamp
- 3. Door hinges
- 4. Door safety latches
- 5. See through door
- 6. Door seals sealing surfaces
- 7. Coupling

- 8. Door open button
- 9. Control panel
- 10. Waveguide cover
- 11. Power supply cord
- 12. Turntable
- 13. Roller stay

CONTROL PANEL



OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st. latch switch, 2nd. interlock relay control switch).

IMPORTANT

When the oven door is closed, the monitor switch contacts (COM-NC) must be open.

When the microwave oven is plugged in a wall outlet, rated voltage is supplied to the noise filter and the control unit.

Figure O-1 on page 25

MICROWAVE COOKING CONDITION HIGH COOKING

Set the variable cooking control to HIGH and set the Light Up Dial.

Function sequence

Figure O-2 on page 25

CONNECTED COMPONENTS	RELAY
Oven lamp, Fan motor, Turntable motor	RY1
Power transformer	RY2

- Rated voltage is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
- The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
- The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
- 4. When the cooking time is up, a signal tone is heard and the relays RY1+RY2 go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off.
- 5. When the door is opened during a cook cycle, the switches come to the following condition.

		COND	ITION
		DURING	DOOR OPEN
SWITCH	CONTACT	COOKING	(NO COOKING)
1st. latch switches	COM-NO	Closed	Open
2nd. interlock relay control switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed

The circuits to the power transformer, fan motor, turntable motor, and the oven lamp are cut off when the 1st. latch switch, 2nd. interlock relay switch are made open.

6. MONITOR SWITCH CIRCUIT

The monitor switch is mechanically controlled by oven door, and monitors the operation of the 1st latch switch and 2nd. interlock relay.

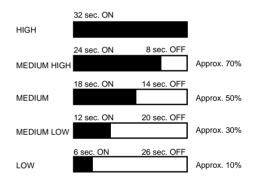
6-1 When the oven door is opened during or after the cycle of a cooking program, the 1st. latch switch and

- 2nd. interlock relay control switch must open their contacts first. After that the contacts (COM-NC) of the monitor switch can be closed.
- 6-2. When the oven door is closed, the contacts (COMNC) of the monitor switch must be opened. After that the contacts of the 1st. latch switch and 2nd. interlock relay control switch are closed.
- 6-3. When the oven door is opened and the contacts of the 1st latch switch and the 2nd. interlock relay remain closed. The fuse M6.3A will blow, because the monitor switch is closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, rated voltage is supplied to the power transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay. The following levels of microwave power are given.

SETTING:



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.

When the open button is pushed, the open button pushes the switch lever up and in turn the latch heads are released from latch hook. When the latch heads are released, the switch lever returns to its original position by its own weight.

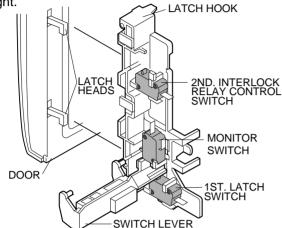


Figure D-1. Door Open Mechanism

1ST. LATCH SWITCH AND 2ND. INTERLOCK RE-LAY CONTROL SWITCH SWITCH

- 1. When the oven door is closed, the contacts (COM-NO) must be closed.
- 2. When the oven door is opened, the contacts (COM-NO) must be opened.

MONITOR SWITCH

- 1. When the oven door is closed, the contacts (COM-NC) must be opened.
- 2. When the oven door is opened, the contacts (COM-NC) must be closed.
- 3. If the oven door is opened and the contacts (COM-NO) of the 1st latch switch and 2nd. interlock relay fail to open, the fuse blows simultaneously with closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A FUSE TEST THE 1ST LATCH SWITCH, 2ND. INTERLOCK RELAY, 2ND. INTERLOCK RELAY CON-TROL SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OP-ERATION. (REFER TO CHAPTER "TEST PROCEDURE".)

MONITOR RESISTOR 0.8Ω 20W

The monitor resistor prevents the fuse bursting when the fuse blows due to the operation of the monitor switch.

FUSE

1. The fuse blows when the contacts (COM-NO) of the 1st latch switch and 2nd. interlock relay remain closed with the oven door open and when the monitor switch closes.

2. If the wire harness or electrical components are shortcircuited, the fuse M6.3A blows to prevent an electric shock of fire hazard.

HIGH VOLTAGE FUSE

The high voltage fuse blows when the high voltage rectifier or the magnetron is shorted.

TEMPERATURE FUSE 120°C (OVEN)

The temp. fuse located on the top of the oven cavity is designed to prevent damage to the oven if the foods in the oven catch fire due to over heating produced by improper setting of cook time or failure of control unit. Under normal operation, the temp. fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the temp. fuse will open at 120°C, causing the oven to shut down. The defective fuse must be replaced with a new one.

THERMAL CUT-OUT 95°C (MAGNETRON)

The thermal cut-out located on the top of the oven cavity is designed to prevent damage to the magnetron if an over heated condition develops in the tube due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc. Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the magnetron, the thermal cut-out will open at 95°C, causing the oven to shut down. When the magnetron has cooled to 75°, the thermal cut-out closes and cook cycle will resume.

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

TURNTABLE MOTOR

The turntable motor drives the roller stay to rotate the turntable.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with any part of the high voltage circuit will result in electrocution. High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power level to HIGH. And set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and microwave leakage test should be carried out.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure"section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse M6.3A in the 1st. latch switch - 2nd. interlock relay - monitor switch - monitor resistor circuit, check the 1st. latch switch, 2nd. interlock relay, 2nd. interlock relay control switch, monitor switch and monitor resistor before replacing the fuse M6.3A.

CK = Check / RE = Replace

	TEST PROCEDURE	Α	В	С	СК	D	Ε	Е	Ε	F	G	G	Н	Н	I	L	M	N	RE	СК	СК	RE	СК	СК	CK	СК	CK	J	K
CONDITION	POSSIBLE CAUSE AND DEFECTIVE PARTS	MAGNETRON	POWER TRANSFORMER	H.V. RECTIFIER ASSEMBLY	HIGH VOLTAGE WIRE	HIGH VOLTAGE CAPACITOR	1ST. LATCH SWITCH	2ND. INTERLOCK RELAY CONTROL SWITCH	MONITOR SWITCH	MONITOR RESISTOR	TEMPERATURE FUSE 120°C (OVEN)	THERMAL CUT-OUT 95°C (MG)	FAN MOTOR	TURNTABLE MOTOR	FUSE M6.3A	CONTROL PANEL	RELAY (RY-1, RY-2)	FOIL PATERN ON P.W.B.	POWER SUPPLY CORD	SHORTED WIRE HARNESS	OPENED WIRE HARNESS	OVEN LAMP OR SOCKET	WALL OUTLET	MISADJUSTMENT SWITCH	HOME FUSE OR BREAKER	BLOCKED COOLING FAN	BLOCKED VENTILATION	NOISE FILTER	H.V. FUSE
OFF	Home fuse blows when power supply cord is plugged into wall outlet.																		0						0				
CONDITION	FUSE M6.3A blows when power supply cord is plugged into wall outlet.								0						0					0				0				0	
	Oven does not start when the Light Up Dial is set.							0			0	0			0	0	0	0			0			0				0	
	Oven lamp does not light (Other function is normal.)																				0	0							
	Fan motor does not operate. (Other function is normal.)												0								0					0			
	Turntable motor does not operate. (Other function is normal.)													0							0								
ON CONDITION	Oven or any electrical parts does not stop when cooking time is 0.															0	0												
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at HIGH)		0	0	0	0										0	0				0			0					0
	Oven does not seems to be operating properly when MEDIUM HIGH, MEDIUM, MEDIUM LOW or LOW is set. (Oven operates properly at HIGH.)															0	0												
	Oven goes into cook cycle but shuts down before end of cooking cycle.										0	0				0										0	0		
	Oven lamp, turntable motor and fan motor do not operate.						0										0				0			0					

PROCEDURE LETTER

COMPONENT TEST

A MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECKS.

Isolate the magnetron from the high voltage circuit by removing all leads connected to the filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for a short circuit filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC 705)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT .

The formula is as follows;

 $P \times t / 4.187 = V \times \Delta T$ $P (W) = 4.187 \times V \times \Delta T / t$

Our condition for water load is as follows:

 $\label{eq:composition} Room\ temperature.....around\ 20^{\circ}C \qquad Power\ supply\ Voltage......Rated\ voltage \\ Water\ load.......1000\ g \qquad Initial\ temperature.......10\pm 2^{\circ}C \qquad Heating\ time.......60\ sec.$

 $P = 70 \times \Delta T$

Measuring condition:

1. Container

The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.

2. Temperature of the oven and vessel

The oven and the empty vessel are at ambient temperature prior to the start of the test.

- 3. Temperature of the water
 - The initial temperature of the water is $(10\pm2)^{\circ}$ C.
- 4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5°C.
- 5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
- 6. The graduation of the thermometer must be scaled by 0.1°C at minimum and an accurate thermometer.
- 7. The water load must be (1000 ± 5) g.
- 8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heatup time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heatup time.

Measuring method:

- Measure the initial temperature of the water before the water is added to the vessel. (Example: The initial temperature T1 = 11°C)
- 2. Add the 1 litre water to the vessel.
- 3. Place the load on the centre of the shelf.
- 4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of $(10 \pm 2)^{\circ}$ C.
- 5. Stir the water to equalize temperature throughout the vessel.
- 6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
- 7. Calculate the microwave power output \underline{P} in watts from above formula.

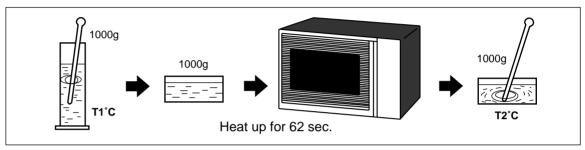
PROCEDURE LETTER

COMPONENT TEST

Initial temperature Temperature after (60 + 2) = 62 sec Temperature difference Cold-Warm	T2 = 21°C
Measured output power The equation is "P = 70 x Δ T"	

JUDGMENT: The measured output power should be at least ± 15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 70 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



В **POWER TRANSFORMER TEST**

WARNING: High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the highvoltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:

a.Primary winding 1.9 ohms approximately

b. Secondary winding 154 ohms approximately

c.Filament winding less than 1 ohm

If the reading obtained are not stated as above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 $k\Omega$ in the other direction.

CARRY OUT 4R CHECKS.



NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BE-CAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIREC-TIONS.

PROCEDURE LETTER

COMPONENT TEST

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about $10M\Omega$ after it has been charged.
- D. A short-circuited capacitor shows continuity all the time.
- E. An open capacitor constantly shows a resistance about 10 M Ω because of its internal 10M Ω resistance.
- F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E SWITCH TEST

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

CARRY OUT 3D CHECKS.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM: Common terminal,

NO; Normally open terminal NC; Normally close terminal

S.C.; Short circuit O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F MONITOR RESISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resist. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor.

The resistance of monitor resistor is approx. 0.8 ohms.

If incorrect readings are obtained, replace the monitor resistor. CARRY OUT <u>4R_CHECKS</u>.

6/11/11/1961 <u>11/1</u>6/1126/16.

G TEMPERATURE FUSE OR THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the temperature fuse or the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

CARRY OUT 4R CHECKS.

Table: Temperature Fuse or Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit).	Temperature of "OFF" condition (open circuit).	Indication of ohmmeter (When room temperature is approx. 20°C.)
Temp. fuse 120°C	This is not resetable type.	Above 120°C	Closed circuit
Thermal cut-out 95°C	Below 75°C	Above 95°C	Closed circuit.

If incorrect readings are obtained, replace the temperature fuse or thermal cut-out.

An open circuit thermal cut-out (MG) indicates that the magnetron has overheated, this may be due

PROCEDURE LETTER

COMPONENT TEST

to resistricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.

An open circuit temperature fuse (OVEN) indicates that the food in the oven cavity may catch fire, this may be due to overheating produced by improper setting of the cooking time or failure of the control panel.

H MOTOR WINDING TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 390 ohms
Turntable motor	Approximately 14.8 kohms

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

I FUSE M6.3A

CARRY OUT 3D CHECKS.

If the fuse M6.3A is blown when the door is opened, check the 1st latch switch, 2nd interlock relay, 2nd interlock relay control switch, monitor switch and monitor resistor.

If the fuse M6.3A is blown by incorrect door switching, replace the defective switch(s) and the fuse M6.3A.

If the fuse M6.3A is blown, there is a shorts or grounds in electrical parts or wire harness.

Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse with the correct value replacement.

J NOISE FILTER TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.

MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Open circuit
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

LINE CROSS CAPACITOR FUSE
0.068µ/AC250V M6.3A

NOISE SUPPRESSION COIL
LINE BYPASS
CAPACITOR
0.0022µ/AC250V

WHT RED

NOISE FILTER

If incorrect readings are obtained, replace the noise filter unit.

CARRY OUT 4R CHECKS.

K HIGH VOLTAGE FUSE TEST

CARRY OUT 3D CHECKS.

If the high voltage fuse is blown, there could be a short in the high voltage rectifier or the magnetron. Check them and replace the defective parts and the high voltage fuse.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE HIGH VOLTAGE FUSE WITH THE CORRECT VALUE REPLACE-MENT.

PROCEDURE	COMPONENT TEST
LETTER	COMPONENT TEST

L CONTROL PANEL ASSEMBLY TEST

The control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.

In this service manual, troubleshooting by replacement is described according to the symptoms indicated.

1. Control Panel

The following symptoms indicate a defective control unit.

1-1 In connection with LEDs

- a) At a certain LED, all or some LEDs do not light up.
- b) At a certain LED, brightness is low.
- c) Only one LED does not light up.
- d) All or some LEDs continue to light up.
- e) A certain group of LEDs do not light up.
- f) The LEDs flicker.
- 1-2 Other possible troubles caused by defective control unit.
 - a) Buzzer does not sound or continues to sound.
 - b) Cooking is not possible.
 - c) Cooking time can not be set.
 - d) Power level can not be set.

M RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 3 and 5 of the 3 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 220 volts, if not check oven circuit.

Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicatedCheck diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 11.5V D.C.	Oven lamp / Turntable motor / Fan motor
RY2	Approx. 11.5V D.C.	Power transformer

: The voltage under the condition when all LEDs light up.

CARRY OUT 4R CHECKS.

N PROCERES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD(PWB) IS OPEN

To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the trouble-shooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

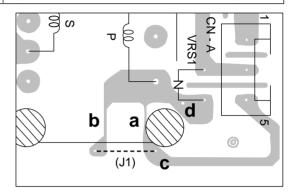
CARRY OUT 3D CHECKS.

PROCEDURE LETTER

COMPONENT TEST

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

CONTROL PANEL ASSEMBLY

OUTLINE OF CONTROL PANEL

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, encoder circuit, indicator circuit and potentiometer circuit.

1) LSI

This LSI controls the encoder signal, potentiometer signal, relay driving signal for oven function, buzzer signal and LED signal.

2) Power Source Circuit

This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application	
VC	-5.0V	LSI(I-1)	

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Door Sensing Switch (Stop Switch)

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, fan motor, turntable motor and light the oven lamp.

8) Encoder

The encoder generates the pulse signal, and the pulse signal is sent to the LSI.

9) Indicator Circuit

Indicator elements are the Light-emitting diodes (LD1-LD24).

This circuit consists of 4-digits and 6 segments.

10) Potentiometer Circuit

The circuit makes setting of the power level by variable resistance.

DESCRIPTION OF LSI

LSI(IZA882DR)
The I/O signal of the LSI(IZA882DR) are detailed in the following table.

Pin No.	Signal	1/0	Description		
1	RST	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.		
2	INT	IN	Signal coming from encoder. When the encoder is turned, the contacts of encoder make pulse signals. And pulse signals are input into INT.		
3	AVSS	IN	A/D converter power source voltage. The power source voltage to drive the A/D converter in the LSI. Connected to VC.		
4	VREF	IN	Reference voltage input terminal. A reference voltage is applied to the A/D converter in the LSI.		
5	K0	IN	Signal coming from potentiometer. By inputting DC voltage corresponding to the power level set by the potentiometer, this input is converted into the power level by the A/D converter built into the LSI.		
6	K1	IN	Terminal to change functions according to the model. Signal in accordance with the model in operation is applied to set up its function.		
7	AVDD	IN	A/D converter power source voltage. The power source voltage to drive the A/D converter in the LSI.		
8	NC	<u> </u>	No connection terminal.		
9	S0	OUT	<u>Digit selection signal.</u> Signal is input to the anodes of the light-emitting diodes (LD19 - LD24).		
10	S1	OUT	<u>Digit selection signal.</u> Signal is input to the anodes of the light-emitting diodes (LD13 - LD18).		
11	S2	OUT	<u>Digit selection signal.</u> Signal is input to the anodes of the light-emitting diodes (LD7 - LD12).		
12	S3	OUT	<u>Digit selection signal.</u> Signal is input to the anodes of the light-emitting diodes (LD1 - LD6).		
13-14	NC	_	No connection terminal.		
15	D0	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD1, LD7, LD13 and LD19).		
16	D1	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD2, LD8, LD14 and LD20).		
17	CNVS	IN	Reference voltage input terminal. A reference voltage is applied to the A/D converter in the LSI. Connected to VC.		
18	VSS	IN	Power source voltage: -5V. The power source voltage to drive the LSI is input to VSS terminal. Connected to VC.		
19	D2	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD3, LD9, LD15 and LD21).		
20	D3	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD4, LD10, LD16 and LD22).		
21	D4	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD5, LD11, LD17 and LD23).		
22	D5	OUT	Segment data signal. Signal is input to the cathodes of the light-emitting diodes (LD6, LD12, LD18 and LD24).		

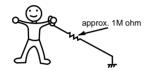
Pin No.	Signal	I/O	Description		
23	D6	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay (RY2). In 100% POWER operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level. ON/OFF time ratio in Micro cooking (a. 32second time base) MICRO ON OFF COOK 100% 32sec. 0sec. 70% 24sec. 8sec. 50% 18sec. 14sec. 30% 12sec. 20sec. 10% 6sec. 26sec.		
24	D7	IN/OUT	Terminal not used.		
25	D8	OUT	Oven lamp, turntable motor and fan motor driving signal(Square Waveform : 50Hz). To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit and relay(RY2) control circuit.		
26	NC	_	No connection terminal.		
27	F0	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal. Door opened; "L" level signal.		
28	F1	_	Terminal not used.		
29	F2	IN	Signal to synchronize LSI with commercial power source frequency. This is basic timing for all real time processing of LSI. H: GND 20 msec		
30	F3	IN	Signal coming from encoder. Signal similar to INT. Pulse signals are input into F3.		
31-32	NC		No connection terminal.		
33	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XOUT.		
34	XIN	IN	Internal clock oscillation frequency input setting. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XIN terminal.		
35	CNTR	OUT	Signal to sound buzzer. A: Completion sound.		
36	VDD	IN	Power source voltage: 0V. The power source voltage to drive the LSI is input to VDD terminal.		

SERVICING

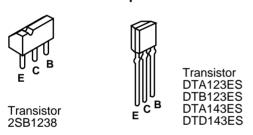
1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

- In order to protect CMOS LSI.
- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.

To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING **SERVICING AND PRESENTS A HAZARD.**

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is so long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W (It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC -10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

- 1. Disconnect oven from power supply.
- Make sure that a definite" click" can be heard when the
 microwave oven door is unlatched. (Hold the door in a
 closed position with one hand, then push the door open
 button with the other, this causes the latch leads to rise,
 it is then possible to hear a "click' as the door switches
 operate.)
- 3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist:

- 1. Door does not close firmly.
- 2. Door hinge, support or latch hook is damaged.
- 3. The door gasket or seal or damaged.
- 4. The door is bent or warped.
- 5. There are defective parts in the door interlock system.
- 6. There are defective parts in the microwave generating and transmission assembly.
- 7. There is visible damage to the oven.

Do not operate the oven:

- 1. Without the RF gasket (Magnetron).
- 2. If the wave guide or oven cavity are not intact.
- 3. If the door is not closed.
- 4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

WARNING FOR WIRING

To prevent an electric shock, take the following manners.

- 1. Before wiring,
 - 1) Disconnect the power supply.
 - 2) Open the door and wedge the door open.
 - 3) Discharge the high voltage capacitor and wait for 60 seconds.
- 2. Don't let the wire leads touch to the following parts;
 - High voltage parts:
 Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
 - 2) Hot parts:
 - Oven lamp, Magnetron, High voltage transformer

and Oven cavity.

- 3) Sharp edge:
 - Bottom plate, Oven cavity, Waveguide flange, Chassis support and other metallic plate.
- 4) Movable parts (to prevent a fault)
 Fan blade, Fan motor, Switch, Switch lever, Open button.
- 3. Do not catch the wire leads in the outer case cabinet.
- 4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
- 5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

- 1. Disconnect oven from power supply.
- 2. Open the oven door and wedge it open.
- 3. Remove the screws from rear and along the side edge of case.
- 4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
- 5. Lift the entire case from the oven.

- Discharge the H.V. capacitor before carrying out any further work.
- 7. Do not operate the oven with the outer case removed. N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR

BEFORE TOUCHING ANY OVEN COMPO-

NENT OR WIRING.

POWER TRANSFORMER REMOVAL

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the wire leads (main wire harness and H.V. fuse) from power transformer.
- 3. Disconnect the H.V. wire of the H.V. rectifier assembly from magnetron.
- 4. Remove the power supply cord, referring to "POWER SUPPLY CORD REPLACEMENT".
- 5. Remove the one (1) screw holding the capacitor holder
- to the oven cavity back plate.
- 6. Disconnect the filament lead of power transformer from the magnetron.
- 7. Disconnect the lead of the power transformer from high voltage capacitor.
- 8. Remove the two (2) screws holding the transformer to bottom plate.
- 9. Remove the transformer.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE RECTIFIER ASSEMBLY AND H.V. FUSE)

To remove the components, proceed as follows.

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the H.V. fuse from the power transformer.
- 3. Disconnect the H.V. wire of the H.V. rectifier assembly from the magnetron.
- 4. Remove one (1) screw holding capacitor holder to oven cavity back plate.
- 5. Disconnect the filament lead of the power transformer from the H.V. capacitor.
- 6. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.
- 7. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.

- 8. Disconnect the H.V. fuse from high voltage capacitor.
- 9. Remove the HVC cover from the high voltage capacitor.
- 10. Now H.V. rectifier assembly, H.V. fuse and H.V. capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE REC-TIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SE-CURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

CAUTION: DO NOT REPLACE ONLY HIGH VOLTAGE RECTIFIER. WHEN REPLACING IT, RE-PLACE HIGH VOLTAGE RECTIFIER AS-SEMBLY.

MAGNETRON REPLACEMENT

Removal

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the wire leads from the magnetron.
- 3. Carefully remove the two (2) screws holding the magnetron to the waveguide flange.
- 4. Lift up magnetron with care so that the magnetron antenna is not hit by any metal object around antenna.
- 5. Now, the magnetron is free.

Re-install

- 1. Re-install the magnetron to the waveguide flange with two (2) screws diagonally as shown in Figure C-1.
- 2. Re-connect the wire leads to the magnetron. Refer to "PICTORIAL DIAGRAM".
- 3. Re-install the outer case and check that the oven is operating properly.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING

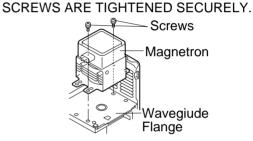


Figure C-1. Magnetron Replacement

OVEN LAMP SOCKET REMOVAL

- 1. CARRY OUT 3D CHECKS.
- 2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
- 3. Tear the cushion from the light mount plate.
- 4. Bend the tab of the light mount plate holding the oven.
- 5. Lift up the oven lamp socket.
- 6. Now, the oven lamp socket is free.

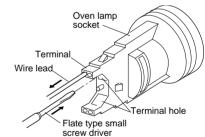


Figure C-2. Oven lamp socket

- 1. CARRY OUT 3D CHECKS.
- 2. Pushing the lever of positive lock® connector.
- 3. Pull out the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CON-NECT THE POSITIVE LOCK® CONNEC-TORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LE-VER FACE YOU (SERVICE ENGINEERS).

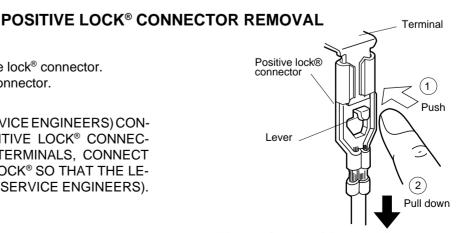


Figure C-3 Positive lock® connector

POWER SUPPLY CORD REPLACEMENT

Removal

- 1. CARRY OUT 3D CHECKS.
- 2. Remove the single (1) screw holding the green/yellow wire to the oven cavity.
- 3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-4 (a).
- 4. Release the moulding cord stopper of the power supply cord from the square hole of the oven cavity back plate, referring to the Figure C-4 (b).
- 5. Now, the power supply cord is free.

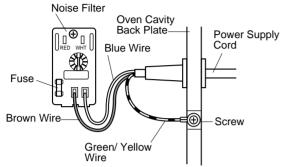


Figure C-4(a). Power Supply Cord Replacement

Re-install

- Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-4 (b).
- 2. Install the earth wire lead of power supply cord and the earth angle to the oven cavity with one (1) screw and tight the screw.
- Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

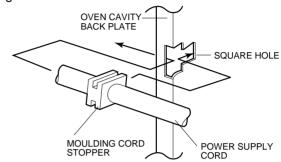


Figure C-4 (b) Power Supply Cord Replacement

TURNTABLE MOTOR REPLACEMENT

Removal

- 1. Disconnect the oven from the power supply.
- 2. Remove the turntable and turntable support from the oven cavity.
- 3. Turn the oven over.
- 4. Cut the four (4) bridges holding the turntable motor cover to the bottom plate with the cutting pliers as shown in Figure C-5.
- CAUTION: DO NOT DROP THE TURNTABLE MOTOR COVER INTO THE OVEN AFTER CUTTING THE BRIDGES. BECAUSE IT WILL DAMAGE THE WIRE LEADS OF THE MOTOR AND IT IS DIFFICULT TO REMOVE IT OUT OF THE OVEN.
- 5. Remove the turntable motor cover from the bottom plate.
- 6. Disconnect the wire leads from the turntable motor.
- 7. Remove the single (1) screw holding the turntable motor to the oven cavity.
- 8. Remove the turntable motor from the oven cavity.

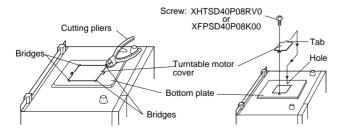


Figure C-5. Turntable Motor Cover

- Remove the O-ring and washer from the turntable motor.
- 10. Now, the turntable motor is free.

Re-install

- 1. Remove the any sharp edges on the turntable motor cover and the bottom plate with the cutting pliers.
- 2. Re-install the O-ring.
- Apply the grease (Shinetsu silicone grease G-420 of Sinetsu Chemical Co. Ltd. or Toray Silicone grease SH-14 of Toray Silicone Co., Ltd.) to the O-ring and the base of the turntable motor shaft as shown in Figure C-6
- 4. Re-install the turntable motor with the O-ring and washer to the oven cavity with the single (1) screw.
- 5. Re-connect the wire leads to the turntable motor.
- 6. Insert the tab of the turntable motor cover into the hole of the bottom plate as shown in Figure C-5.
- 7. Re-install the turntable motor cover to the bottom plate with one (1) screw XHTSD40P08RV0 or XFPSD40P08K00 as shown in Figure C-5.

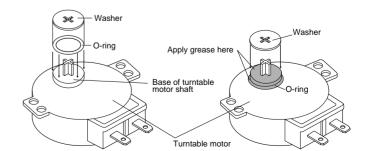


Figure C-6. Washer and O-ring Installation and Grease Applying.

FAN MOTOR REPLACEMENT

REMOVAL

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the wire leads from the fan motor.
- 3. Remove the one (1) screw holding the chassis support to the oven cavity front plate.
- 4. Remove the chassis support.
- 5. Release the filament lead of the power transformer and the H.V. wire from the fan duct.
- Remove the one (1) screw holding the fan duct to the waveguide flange.
- 7. Release the fan motor assembly from the oven cavity.
- 8. Remove the fan blade from the fan motor shaft according to the following procedure.
 - 1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

- Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.
- Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.
- Do not transform the bracket by touching with the pliers.
- Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
- 3) Now, the fan blade will be free.

CAUTION:

- Do not re-use the removed fan blade because the hole (for shaft) may be lager than normal.
- Remove the two (2) screws holding the fan motor to the fan duct.

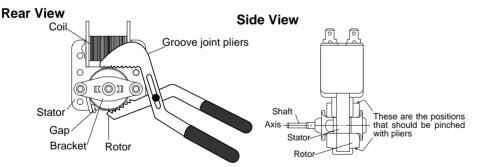
10. Now, the fan motor is free.

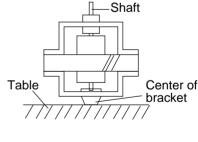
INSTALLATION

- Install the fan motor to the fan duct with the two (2) screws.
- 2. Install the fan blade to the fan motor shaft according the following procedure.
- 1) Hold the centre of the bracket which supports the shaft of the fan motor on the flat table.
- Apply the screw lock tight into the hole (for shaft) of the fan blade.
- 3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

CAUTION:

- Do not hit the fan blade strongly when installed because the bracket may be transformed.
- Make sure that the fan blade rotates smooth after installed.
- Make sure that the axis of the shaft is not slanted.
- Install the fan motor assembly to the oven cavity by fitting the holes of the fan duct into the tabs of the oven cavity.
- 4. Re-install the fan duct to the waveguide flange with the one (1) screw.
- 5. Insert the end of the chassis support into the slit of the oven cavity rear cabinet.
- 6. Re-install the chassis support to the oven cavity front plate with the one (1) screw.
- 7. Install the filament lead and the H.V. wire into the hole of the fan duct .
- 8. Connect the wire leads to the fan motor, referring to the pictorial diagram.





CONTROL PANEL ASSEMBLY AND SWITCH LEVER REMOVAL

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the leads from the control unit.
- 3. Remove the one (1) screw holding the chassis support to the front plate of the oven cavity.
- 4. Remove the chassis support from the oven.
- 5. Lift up the control panel and release it from the oven cavity.
- 6. Now, the control panel assembly is free.
- 7. Open the door. Remove the switch lever from the front plate of the oven cavity.
- 8. Now, the switch lever is free.

1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH REMOVAL

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect wire leads from all switches.
- Remove the control panel assembly and switch lever from the oven cavity front flange, referring to chapter "CONTROL PANEL ASSEMBLY AND SWITCH LE-VER REMOVAL"
- 4. Remove two (2) screws holding latch hook to oven flange.
- 5. Remove latch hook assembly from oven flange.
- 6. Push outward on the two (2) retaining tabs holding switch in place.
- 7. Switch is now free.

Re-install

1. Re-install each switch in its place. The 2nd. interlock

- relay control switch is in upper position. The 1st. latch switch and monitor switch are in the lower position.
- 2. Re-connect wire leads to each switch. Refer to chapter "Pictorial Diagram".
- 3. Secure latch hook (with two (2) mounting screws) to oven flange.
- 4. Re-install the switch lever and the control panel assembly to the oven cavity front flange.
- 5. Re-connect wire leads to the control unit. Refer to chapter "Pictorial Diagram".
- Make sure that monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure", and Adjustment Procedure below.

1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH ADJUSTMENT

If the 1st. latch switch, 2nd. interlock relay control switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

- 1. Loosen the two (2) screws holding the latch hook to the flange of the oven front face.
- 2. With the door closed, adjust latch hook by moving it back and forth and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The horizontal position of the latch hook should be adjusted so that the monitor switch is activated with the door closed. The vertical position of the latch hook should be adjusted so that the 1st. latch switch and the 2nd. interlock relay control switch are activated with the door closed.
- 3. Secure the screws firmly.
- 4. Check the operation of all switches. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, make sure of the following.

 In and out play of the door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of door toward the oven face. Both results (play in the door)

- should be less than 0.5mm.
- The 1st. latch switch and 2nd. interlock relay control switch interrupt the circuit before the door can be opened.
- 3. The monitor switch contacts close when the door is opened.
- 4. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

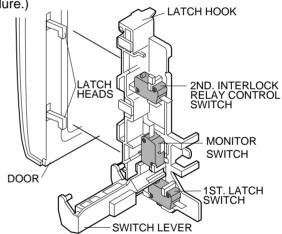


Figure C-7. Latch Switch Adjustments

DOOR REPLACEMENT

REMOVAL

- 1. Disconnect oven from power supply.
- 2. Push the open button and open the door slightly.
- Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and corner portion of door panel as shown in Figure C-8 to free engaging parts.
- 4. Try the principles of the lever and lift up the choke cover by inserting a putty knife in order shown in figure C-8.
- 5. Release choke cover from door panel.
- 6. Now choke cover is free.
- 7. Release two (2) pins of door panel from two (2) hole of upper and lower oven hinges by lifting up.

- 8. Now, door panel is free from oven cavity.
- Release door panel from ten (10) tabs of door frame and remove door frame by sliding the door panel downward.
- 10. Now, door panel with sealer film is free.
- 11. Tear sealer film from door panel.
- 12. Now, door panel is free.
- 13. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head
- 14. Now, latch head and latch spring are free.
- 15. Remove door screen from door frame.
- 16.Now, door screen is free.

RE-INSTALL

- 1. Re-install door screen to door frame.
- Re-install latch spring to the head. Re-install latch spring to the door frame. Re-install latch head to the door frame.
- 3. Re-install door panel to door frame by fitting ten (10) tabs of door frame to ten (10) holes of door panel.
- 4. Put sealer film on door panel. Refer to "Sealer Film" and figure C-10, on how to handle the new film.
- 5. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
- 6. Re-install choke cover to door panel by pushing.

Note: After any service to the door;

- (A) Make sure that 1st. latch switch, 2nd. latch switch and monitor switch are operating properly. (Refer to chapter "Test Procedures".).
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

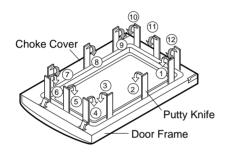


Figure C-8. Door Disassembly

After any service, make sure of the following:

- 1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through centre of latch hole.
- 2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
- 3. Door is positioned with its face pressed toward cavity face plate.
- 4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from oven cavity.

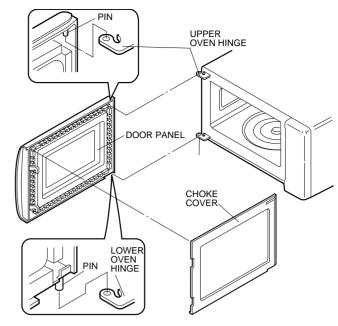


Figure C-9. Door Replacement

SEALER FILM

Installation

- 1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. C-10.
- 2. Tear the backing film by pulling the adhesive tape.
- 3. Put the pasted side of the sealer film on the door panel.

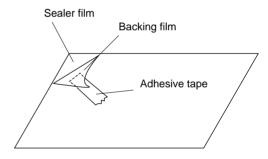


Figure C-10. Sealer film

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm² at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

- Make sure that the test instrument is operating normally as specified in its instruction booklet. Important:
 - Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

NARDA 8100

NARDA 8200

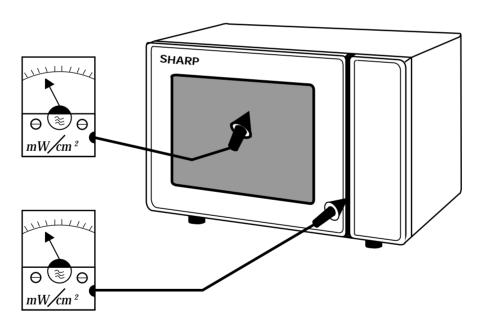
HOLADAY HI 1500

SIMPSON 380M

- 2. Place the oven tray into the oven cavity.
- 3. Place the load of 275 ± 15 ml of water initially at 20 ± 5 °C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.

The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.

- Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
- 5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
- 6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

SCHEMATIC NOTE: CONDITION OF OVEN

- 1. DOOR CLOSED.
- 2. CLOCK APPEARS ON DISPLAY.

NOTE: "★" indicates components with potential above 250V.

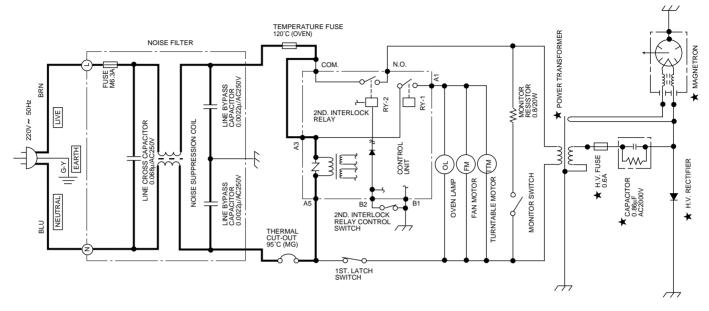


Figure O-1 Oven Schematic-OFF Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

- 1. DOOR CLOSED.
- 2. COOKING TIME PROGRAMMED.
- 3. START KEY TOUCHED.

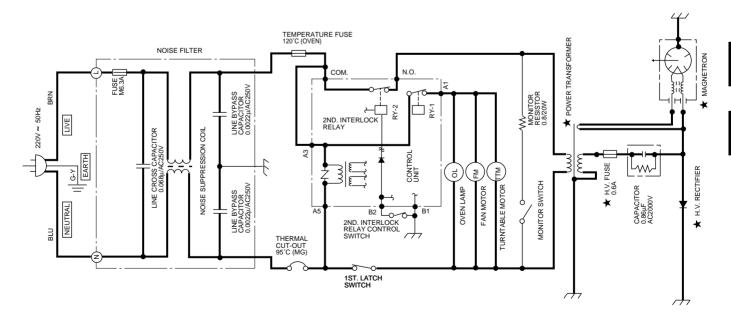
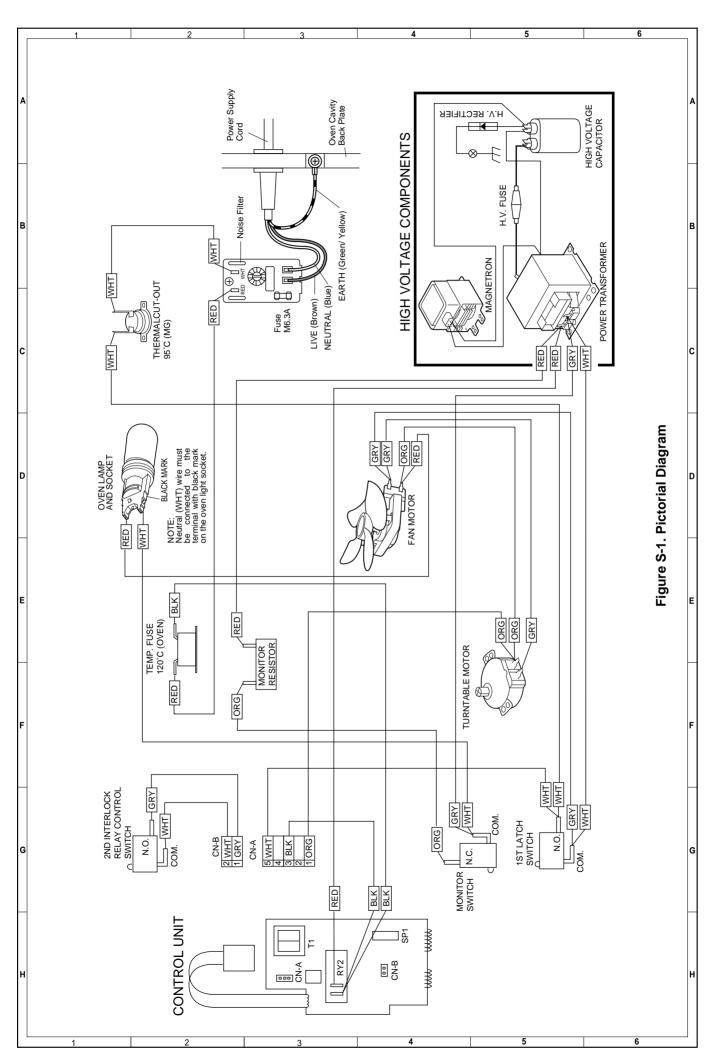
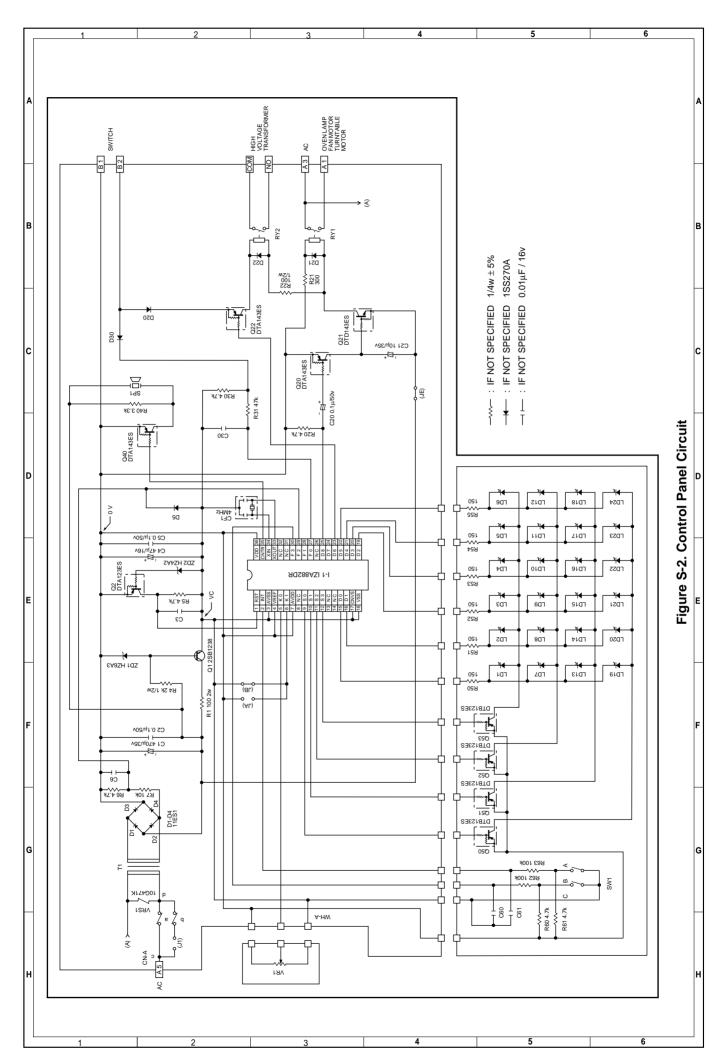
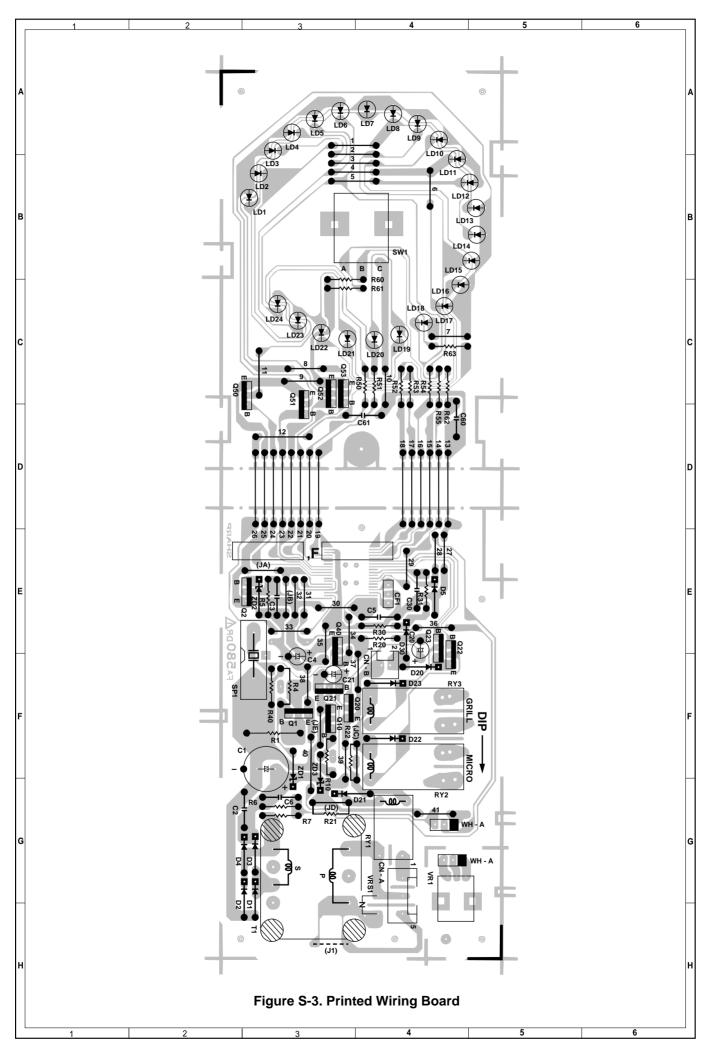


Figure O-2 Oven Schematic-ON Condition







PARTS LIST

Note: The parts marked " Δ " may cause undue microwave exposure. The parts marked "*" are used in voltage more than 250V.

	The parts marked "*" are used in voltage more than 250V.						
	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE		
			ELECTRIC PARTS				
	1- 1	QFS-TA038WRE0	Temperature fuse 120°C	1	AK		
	1- 2	QSW-MA110WRE0	1st. latch switch & 2nd. interlock relay control switch	2	AK		
	1- 3	QSW-MA111WRE0	Monitor switch	1	AK		
	1- 4 1- 5	QACC-A089WRE0 OSOCLA022WRE0	Power supply cord Oven lamp socket	1 1	AS AG		
	1- 6	FH-DZA047WRK0	High voltage rectifier	1	AQ		
*	1- 7	RC-QZA200WRE0	High voltage capacitor	1	AV		
*	1- 7	RC-QZA201WRE0	High voltage capacitor (Interchangeable)	1	AW		
	1- 8	RMOTEA340WRE0	Fan motor	1	AX		
	1- 8	RMOTEA362WRE0	Fan motor (Interchangeable)	1	AY		
$\Delta *$	1- 9 1-10	RV-MZA198WRE0	Magnetron Oven lamp	1 1	BN AK		
	1-10	RLMPTA069WRE0 RMOTDA226WRE0	Turntable motor	1	AR AT		
	1-11	RMOTDA173WRE0	Turntable motor (Interchangeable)	1	AX		
*	1-12	RTRN-A539WRE0	Power transformer	1	BP		
	1-13	RTHM-A079WRE0	Thermal cut-out 95°C	1	AL		
	1-14	RR-WZA022WRE0	Monitor resistor 0.8 Ω 20W	1	AK		
	1-15	FPWBFA299WRK0	Noise filter	1	AQ		
*	1-16 1-17	QFS-IA004WRE0 QFS-C0019WRE0	H.V. fuse 0.6A Fuse M6.3A	1 1	AK AE		
	1-17	QF5-CUUI9WKEU	<u> </u>		AL		
			CABINET PARTS				
	2- 1	GCABUA602WRP0	Outer case cabinet	1	AX		
	2- 2	GDAI-A269WRP0	Bottom plate	1	AS		
	2- 3	GLEGPA074WRE0	Foot	2	AC		
			CONTROL PANEL PARTS				
	3- 1	CPWBFA778WRK0	Control unit	1	BP		
	3- 1A	QCNCMA430DRE0	3-pin connector (CN-A)	1	AG		
	3- 1B	QCNCMA414DRE0	2-pin connector (CN-B)	1	AB		
	3- 1C	FW-VZA234DRE0	Lead wire (WH-A)	1	AD		
	C1	VCEAB31VW477M	Capacitor 470uF 35V	1	AC		
	C2 C3	RC-KZA087DRE0 VCKYD11CY103N	Capacitor 0.1uF 50V Capacitor 0.01uF 16V	1 1	AB		
	C3	VCEAB31CW476M	Capacitor 47uF 16V	1	AH AA		
	C5	RC-KZA087DRE0	Capacitor 0.1uF 50V	1	AB		
	C6	VCKYD11CY103N	Capacitor 0.01uF 16V	1	AH		
	C20	VCEAB31HW104M	Capacitor 0.1uF 50V	1	AB		
	C21	VCEAB31VW106M	Capacitor 10uF 35V	1	AB		
	C30 C60-61	VCKYD11CY103N VCKYD11CY103N	Capacitor 0.01uF 16V Capacitor 0.01uF 16V	1 2	AH AH		
	CF1	RCRS-A012DRE0	Ceramic resonator (CST4.00MGW)	1	An AD		
	D1-4	VHD11ES1///-1	Diode (11ES1)	4	AB		
	D5	VHD1SS270A/-1	Diode (1SS270ATA)	1	AA		
	D20-22	VHD1SS270A/-1	Diode (1SS270ATA)	3	AA		
	D30	VHD1SS270A/-1	Diode (1SS270ATA)	1	AA		
	I-1 LD1-24	RH-IZA882DRE0	LSI	1 24	AK		
	Q1	VHPLTL1CHE/-3 VS2SB1238//-3	Light emitting diode (LED) Transistor (2SB1238)	1	AD AA		
	Q1 Q2	VSDTA123ES/-3	Transistor (ZSB1236)	1	AA		
	Q20	VSDTA143ES/-3	Transistor (DTA143ES)	1	AB		
	Q21	VSDTD143ES/-3	Transistor (DTD143ES)	1	AB		
	Q22	VSDTA143ES/1B	Transistor (DTA143ES)	1	AA		
	Q40	VSDTA143ES/-3	Transistor (DTA143ES) Transistor (DTB123ES)	1 4	AB		
	Q50-53 R1	VSDTB123ES/-3 VRS-L63DA101J	Resistor (DTB123ES) Resistor 100 ohm 2W	1	AC AD		
	R4	VRD-B12HF202J	Resistor 2.0k ohm 1/2W	1	AD AB		
	R5-6	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	2	AA		
	R7	VRD-B12EF103J	Resistor 10k ohm 1/4W	1	AA		
	R20	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA		
	R21 R22	VRD-B12EF301J VRD-B12HF101J	Resistor 300 ohm 1/4W Resistor 100 ohm 1/2W	1 1	AA AB		
	R30	VRD-B12HF101J VRD-B12EF472J	Resistor 100 onm 1/2W Resistor 4.7k ohm 1/4W	1	AB		
	R31	VRD-B12EF473J	Resistor 47k ohm 1/4W	1	AA		
	R40	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA		
	R50-55	VRD-B12EF151J	Resistor 150 ohm 1/4W	6	AA		
	R60-61	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	2	AA		
	R62-63	VRD-B12EF104J	Resistor 100k ohm 1/4W	2	AA 7 T		
	RY1 RY2	RRLY-A111DRE0 RRLY-A094DRE0	Relay (JV12S-KT) Relay (OMIF-S-112LM)	1 1	AL AN		
	SP1	RALM-A014DRE0	Buzzer (PKM22EPT-THAI)	1	AG		
	SW1	RVR-BA018WRE0	Rotary encoder	1	AL		

Note: The parts marked " Δ " may cause undue microwave exposure. The parts marked "*" are used in voltage more than 250V.

	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE			
	T1	RTRNPA121DRE0	Transformer	1	AT			
	VR1	RVR-BA014DRE0	Potentiometer	1	AF			
	VRS1	RH-VZA032DRE0	Varistor (10G471K)	1	AE			
	ZD1	VHEHZ6A3///-1	Zener diode (HZ6A3)	1	AC			
ļ	ZD2	VHEHZ4A2///-1	Zener diode (HZ4A2)	1	AA			
	3- 2 3- 3	HPNLTA134WRE0	Timer sheet	1	AG			
	3- 3	JKNBKA598WRF0 LHLD-A186WRF0	Timer knob LED holder	1 1	AF AL			
	3-5	HPNLCB453WRR0	Control panel	1	AT			
	3- 6	JKNBKA599WRF0	Vari. knob	1	AF			
i	3- 7	LSTPPA178WRF0	Vari. knob stopper	1	AG			
	3- 8	MSPRCA107WRE0	Vari. spring	1	AC			
	3- 9	JBTN-B071WRF0	Open button	1	AF			
	3- 10	MSPRCA050WRE0	Open button spring	1	AB			
J	3- 11	XEPSD30P08XS0	Screw : 3mm x 8mm	4	AA			
ا ۱	4 1	DUOK AGGERDEG	OVEN PARTS	1 1	7.0			
Δ	4- 1 4- 2	PHOK-A086WRF0 LANGOA470WRW0	Latch hook	1	AQ AV			
	4- 2	PCUSUA194WRP0	Light mount plate Cushion	1 1	AV AC			
	4- 3	LBNDKA095WRP0	Capacitor holder	1	AM			
	4-5	NFANJA029WRE0	Fan blade	1	AL			
i	4- 6	PDUC-A623WRP0	Fan duct	1	AK			
Δ	4- 7	FOVN-A408WRT0	Oven cavity	1	BM			
	4-8	GLEGPA062WRF0	Leg	1	AK			
	4- 9	LANGTA318WRP0	Chassis support	1	AQ			
ŀ	4-10 4-11	MLEVPA206WRF0	Switch lever Waveguide cover	1	AL			
	4-11	PCOVPA276WRE0 PCUSUA461WRP0	waveguide cover Cushion	1 1	AM AB			
	4-13	PCUSUA443WRP0	Cushion	1	AE			
	4-14	PCOVPA334WRE0	HVC cover	1	AG			
	4-15	LANG-A061WRP0	Air guide	1	AP			
l	4-16	PPACGA097WRE0	0-ring	1	AG			
	4-17	PCUSGA312WRP0	Cushion	1	AB			
	4-18	PCUSUA235WRP0	Cushion	1	AE			
l	4-19	PCUSUA270WRP0	Cushion	1	AG			
. 1	г 1	EDODES COCHDEO	DOOR PARTS	1	3.00			
Δ	5- 1 5- 2	FDORFA296WRT0 GWAKPA516WRF0	Door panel Door frame	1 1	AT AY			
Δ	5- 3	HPNL-A669WRR0	Door screen	1	AS			
Δ	5-4	LSTPPA154WRF0	Latch head	1	AG			
	5- 5	MSPRTA084WRE0	Latch spring	1	AB			
i	5- 6	PSHEPA333WRE0	Sealer film	1	AE			
	5- 7	XCPSD40P06000	Screw : 4mm x 6mm	4	AA			
J	5- 8	GCOVHA377WRF0	Choke cover	1	AK			
			MISCLANEOUS					
	6- 1	FROLPA046WRK0	Roller stay	1	AQ			
	6- 2	NTNT-A034WRF0	Turntable	1	AM			
	6- 2	NTNT-A060WRE0	Turntable (Interchangeable)	1	AP			
	6- 3	TINS-A653WRR0	Operation manual	1	AM			
ł	6- 4 6- 5	FW-VZB663WRE0 TSPCNC585WRR0	Main wire harness Rating label	1	AU AC			
	6- 5 6- 6	TCAUHA214WRR0	K caution label	1	AC AC			
	6- 7	LHLDWA056WRE0	Cable clip	1	AC			
	6- 8	FW-VZB665WRE0	Switch harness	1	AF			
	6- 9	TLABMA549WRR0	Menu label	1	AE			
	SCREWS AND WASHERS							
	7- 1	XOTSE40P08000	Screw : 4mm x 8mm	4	AA			
	7- 2	XFPSD40P08K00	Screw : 4mm x 8mm	9	AA			
	7- 3	LX-EZA042WRE0	Special screw	2	AB			
	7- 4	LX-WZA028WRE0	Special Washer	1	AB			
ļ	7- 5	XHTSD40P08RV0	Screw : 4mm x 8mm	2	AA			
	7- 6 7- 7	XHPSD30P06000 XOTSD40P12RV0	Screw: 3mm x 6mm	1	AA			
	7- 7 7- 8	XOTSD40P12RV0 XOTSD40P12000	Screw : 4mm x 12mm Screw : 4mm x 12mm	11 4	AA AA			
١	. •				2.11			

HOW TO ORDER REPLACEMENT PARTS

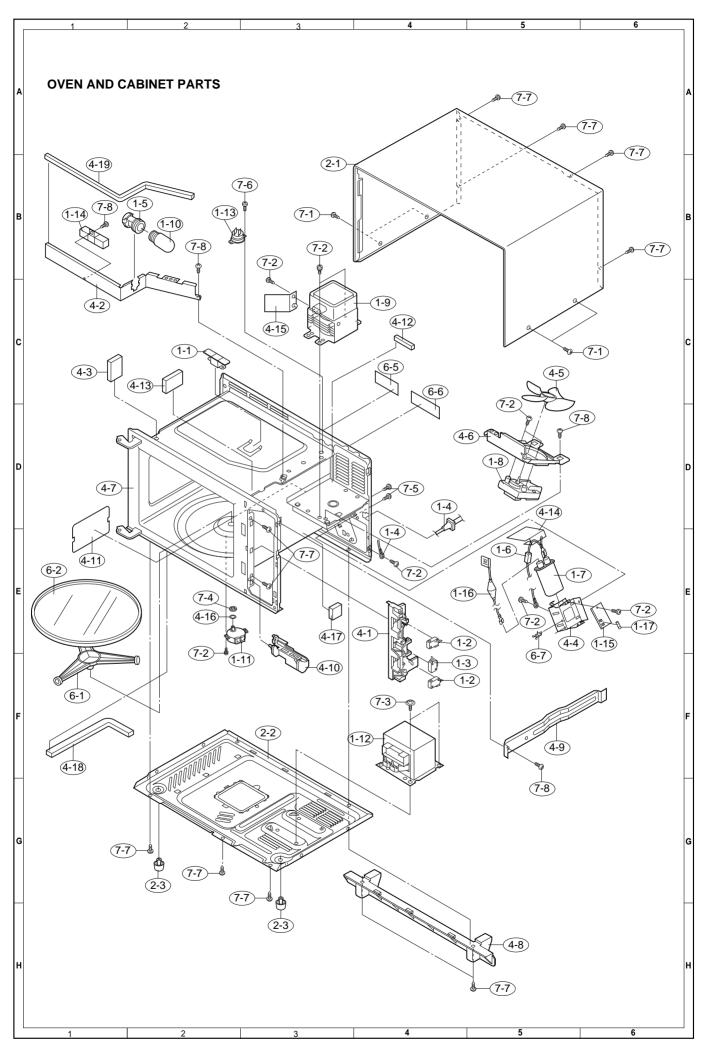
To have your order filled prompty and correctly, please furnish the following information.

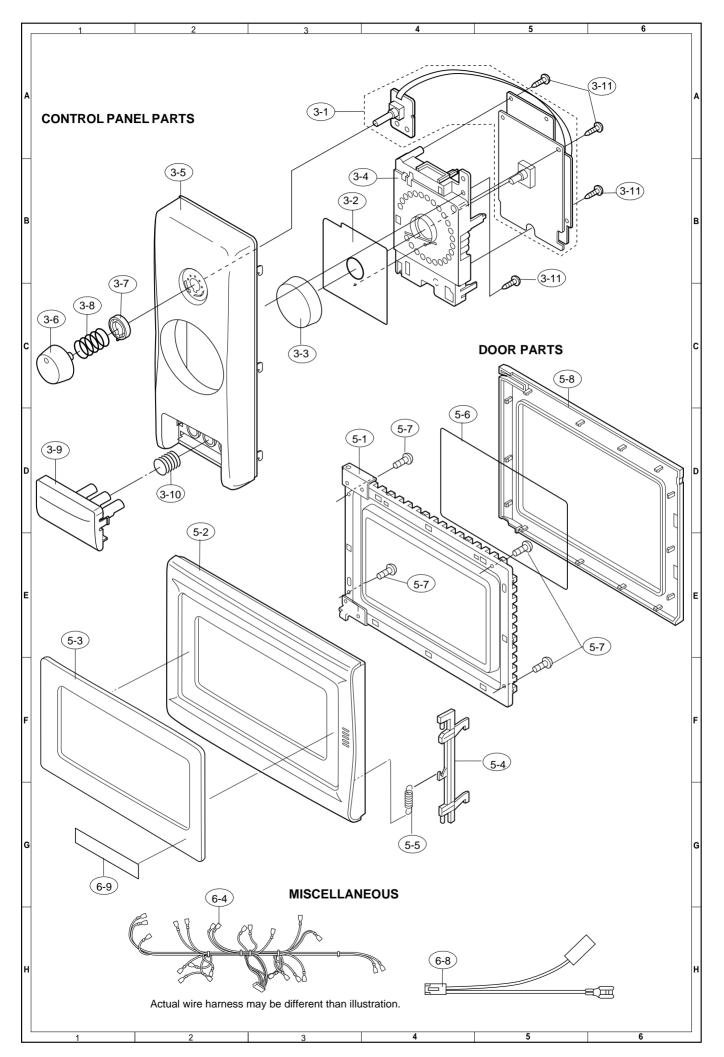
1. MODEL NUMBER

2. REF. NO.

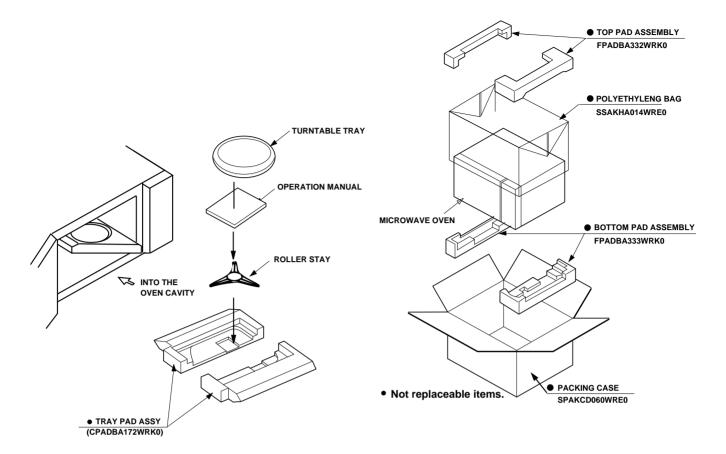
3. PART NO.

4. DESCRIPTION





PACKING AND ACCESSORIES



SHARP